

REMARKS

Claims 1 through 20 are pending in the application, with claims 16-17 having been withdrawn from consideration.

Claim 1 has been amended and new claims 18-20 have been added in order to more particularly point out, and distinctly claim the subject matter to which the Applicants regard as their invention. It is believed that this Amendment is fully responsive to the Office action dated April 29, 2003.

Premature Final Office Action

It should be noted that even though Svilans (U.S. Patent No. 6,222,200) has been cited as a prior art pertinent to the Applicant's disclosure. However, it is also communicated by the Office that this prior art reference was not relied upon, which is quite true in that no anticipation or obviousness rejection was ever formulated based on this prior art reference. In the outstanding Office action, by formulating a new ground of anticipation rejection for the very first time; yet, also making this Office action final, the Office is essentially formulating a new ground of rejection without allowing the Applicant an opportunity to respond to this rejection. This is a clear violation of procedural fairness. Therefore, withdrawal of the final Office action is respectfully requested.

In the Drawings

The drawings are still objected to because Fig. 9 appears to include a typographical error.

With regard to Fig. 9, the Applicant wishes to maintain current Fig. 9 in the present form, as the present invention does not in fact exclude the existence of such a single additional layer 3b. It is true that page 21, line 29 describes that "the semiconductor device 50 has a construction similar to that of the semiconductor device 40" of Fig. 8. What is intended here is that the cancellation of the strain takes place similarly as a result of alternate stacking the layers 3a and 3b. It is believed that the existence of such a single additional layer 3b causes no substantial change in the foregoing cancellation of the strain in the embodiment of Fig. 9.

Reconsideration and withdrawal of this objection are respectfully requested.

Claim Rejections Under 35 USC §102

Claims 1-15 is rejected under 35 U.S.C. §102(e) as being anticipated by Svilans, US Patent No. 6,222,200 (previously made of record in the previous Office Action).

It should be noted that the present invention addresses a photodetector operable in a system designed for 10Gbit operation as set forth in page 16, line 21. The present invention discloses a total thickness of the first and second semiconductor layers to be less than $1.5\mu\text{m}$ in the embodiments.

Svilans, on the other hand, is silent about the use of the photodiode for such a ultrahigh speed application and uses the total thickness of $1.5\mu\text{m}$.

Due to this fundamental difference, there is a difference in the optimum structure for realizing the highest efficiency of optical absorption between the present invention and the Svilans. More specifically, the present invention recites the optimum strain of 0.4% for the first semiconductor layer, while Svilans discloses the optimum strain to be 0.25%.

To highlight this point, the Applicant has amended claim 1 by incorporating therein the feature that the strain of the first semiconductor layer is larger than 0.25%. This feature is neither disclosed nor taught in the asserted prior art reference. By so amending, claims 1-15 are believed to be placed in condition for allowance.

New Claims:

New claims 18, 19 and 20 are added herein by amendment. One difference between the instant application and Svilan is the thickness of the first semiconductor 12A being 50nm or more as compared to the thickness of compressive strain layer 22 being 80nm. Based on this difference, independent claim 19 is amended.

Independent claim 19 is supported by way of an example in Figures 3 and 7, wherein there is indeed shown, by way of an example, a semiconductor photodetection detector, comprising a semiconductor substrate 11 of a first conductivity type; a photodetection layer 12 formed on said semiconductor substrate 11; a region of a second conductivity type 13 opposite to said first conductivity type being formed in a part of said photodetection layer 12; and an electrode applying an electric field to said photodetection layer 12 via said region of said second conductivity type such that said electric field acts in a thickness direction of said photodetection layer 12; said photodetection layer 12 comprising a first semiconductor layer 12A having a first thickness l_w and

accumulating therein a compressive strain and absorbing an optical radiation; and a second semiconductor layer 12B having a second thickness lb smaller than said first thickness lw and accumulating therein a tensile strain, said first semiconductor layer 12A and said second semiconductor layer 12B being stacked alternately and repeatedly in said photodetection layer 12, wherein said tensile strain in said second semiconductor layer has a magnitude larger than a magnitude of said compressive strain in said first semiconductor layer (Fig. 3, lw, lb); and wherein said first semiconductor layer has a thickness incrementally and inclusively beginning from 50nm and ending at less than 80nm (Page 6, line 27).

Independent claim 19 is patentably distinguished over Sivilan. All claims dependent thereon, by virtue of inherency, are also patentably distinguished over Sivilan.

Newly added claim 20 is substantially the same as the unamended claim 1 adding thereto the feature that said first semiconductor layer has a thickness greater than 80nm.

Regarding newly added claim 18, the applicant added thereto a feature that the total thickness of the first and second semiconductor layers as being smaller than 1.5 μm .

Allowance of newly added claims 18-20 is respectfully requested.

CONCLUSION

In view of the aforementioned amendments and accompanying remarks, all pending claims are in condition for allowance, which action, at early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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